Amendments to the Claims:

1. (Canceled)

2. (Currently amended) The magnetic resonance method as set forth in ~~claim 1~~ claim 6, wherein the performing of magnetic resonance imaging comprises:

acquiring a magnetic resonance imaging repetition, frame or dynamic, the acquiring including acquiring volumetric magnetic resonance imaging data;

repeating the acquiring; and

interspersing the measuring between or concurrently with repetitions of the acquiring.

3. (Currently amended) The magnetic resonance method as set forth in ~~claim 1~~ claim 6, further comprising:

acquiring a magnetic resonance imaging repetition, frame or dynamic, the acquiring including acquiring volumetric magnetic resonance imaging data;

repeating the acquiring;

computing a main magnetic field shim current based on the ~~determined at least one main magnetic field nonuniformity parameter~~ measured spatial data corresponding to the main magnetic field; and

applying the computed main magnetic field shim current during the acquiring of a subsequent magnetic resonance imaging repetition, frame or dynamic.

4. (Currently amended) The magnetic resonance method as set forth in claim 1, further comprising:

compensating for a change in the main magnetic field by adjusting the main magnetic field based on the ~~at least one main magnetic field nonuniformity parameter~~ measured spatial data corresponding to the main magnetic field.

5. (Currently amended) The magnetic resonance method as set forth in ~~claim 1~~ claim 6, further comprising:

compensating for a change in the main magnetic field by adjusting an image reconstruction of imaging data collected by the performing of magnetic resonance imaging based on the ~~at least one main magnetic field nonuniformity parameter~~ measured spatial data corresponding to the main magnetic field.

6. (Currently amended) ~~The~~ A magnetic resonance method ~~as set forth in claim 1, wherein the measuring and determining comprise~~ comprising:

performing magnetic resonance imaging in a main magnetic field; and

measuring spatial data corresponding to the main magnetic field by applying a spatially nonselective radio frequency excitation, reading at least two gradient echoes using magnetic field gradients imposed along a selected direction; ~~and~~, computing a nonuniformity of the main magnetic field along the selected direction from the at least two gradient echoes, repeating the reading and computing for a plurality of selected directions, and mapping the main magnetic field based on the computed nonuniformities along the selected directions;

wherein the measuring of spatial data corresponding to the main magnetic field is performed concurrently with the performing of magnetic resonance imaging.

7. (Canceled)

8. (Original) The magnetic resonance method as set forth in claim 6, wherein the reading of at least two gradient echoes comprises:

applying a balanced magnetic field gradient along the selected direction, the balanced magnetic field gradient having at least two lobes of same polarity separated by a lobe of opposite polarity; and

reading the at least two gradient echoes during the two lobes of same polarity.

9. (Canceled)

10. (Currently amended) The magnetic resonance method as set forth in ~~claim 9~~ claim 6, wherein the applying of a spatially nonselective radio frequency excitation comprises:

applying a spatially nonselective radio frequency excitation having a low flip angle of less than about 5 degrees.

11. (Canceled)

12. (Original) The magnetic resonance method as set forth in claim 6, wherein the computing comprises:

Fourier transforming each gradient echo to reconstruct a projection along the selected direction; and

computing a complex phase difference between the projections reconstructed from the at least two gradient echoes, the nonuniformity of the main magnetic field along the selected direction corresponding to the complex phase difference.

13. (Original) The magnetic resonance method as set forth in claim 12, wherein the reading of at least two gradient echoes using magnetic field gradients imposed along a selected direction comprises:

imposing the multi-lobe magnetic field gradient includes at least five lobes along the selected direction, the multi lobe magnetic field gradient including a -a:+b:-b:+b:-a lobe area ratio where a and b represent gradient lobe areas and the positive and negative signs represent gradient lobe polarities; and

reading the at least two gradient echoes during the two +b lobes.

14. (Currently amended) The magnetic resonance method as set forth in ~~claim 1~~ claim 6, wherein[[:]] the measuring of spatial data corresponding to the main magnetic field includes reading coils of an array of spatially separated coils.

15. (Canceled)

16. (Currently amended) ~~The~~ A magnetic resonance method ~~as set forth in claim 1, wherein the~~ comprising:

performing magnetic resonance imaging in a main magnetic field;

measuring ~~of~~ spatial data corresponding to a main magnetic field ~~comprises:~~ by exciting and sampling magnetic resonance at a resonance frequency different from the resonance frequency used in performing the magnetic resonance imaging[[;]] and deriving spatial data corresponding to the main magnetic field from the sampled magnetic resonance; and

determining at least one main magnetic field nonuniformity parameter from the spatial data corresponding to the main magnetic field;

wherein the measuring and determining are performed concurrently with the performing of magnetic resonance imaging.

17. (Original) The magnetic resonance method as set forth in claim 16, wherein the exciting and sampling of magnetic resonance at a resonance frequency different from the resonance frequency used in performing the magnetic resonance imaging is performed during the magnetic resonance imaging and further comprises:

sampling magnetic resonance at the resonance frequency different from the resonance frequency used in performing the magnetic resonance imaging at a plurality of spatial locations.

18-19. (Canceled)

20. (Currently amended) ~~The~~ A magnetic resonance imaging apparatus ~~as set forth in claim 19, wherein the measuring means comprises~~ comprising:

a magnetic resonance imaging scanner configured to perform magnetic resonance imaging in a main magnetic field;

a plurality of magnetic field sensors disposed at different positions in the main magnetic field, the plurality of magnetic field sensors operating independently from the magnetic resonance imaging ~~means~~ scanner, the plurality of

magnetic field sensors configured to measure spatial data corresponding to the main magnetic field; and

a processor configured to determine at least one main magnetic field nonuniformity parameter from the spatial data corresponding to the main magnetic field.

21. (Currently amended) The magnetic resonance imaging apparatus as set forth in claim 20, wherein the magnetic field sensors ~~are selected from a group consisting of:~~ comprise:

~~Hall effect magnetic field sensors,~~

resonance based active magnetic field sensors operating at a resonance frequency different from a magnetic resonance frequency of the ~~acquiring means~~ magnetic resonance imaging scanner; ~~and~~

~~a plurality of field lock coils tuned to a magnetic resonance frequency of the acquiring means~~.

22. (Canceled)

23. (Currently amended) The magnetic resonance imaging apparatus as set forth in ~~claim 19~~ claim 20, further comprising:

a ferromagnetic structure disposed in the main magnetic field, the ferromagnetic structure inducing changes in the main magnetic field over time responsive to the magnetic resonance imaging.

24. (Currently amended) The magnetic resonance imaging apparatus as set forth in ~~claim 19~~ claim 20, further comprising:

~~a means for adjusting~~ shim coils configured to adjust the main magnetic field during the magnetic resonance imaging based on the at least one main magnetic field nonuniformity parameter.

25. (Currently amended) The magnetic resonance imaging apparatus as set forth in ~~claim 19~~ claim 20, further comprising:

a ~~means for reconstructing~~ reconstruction processor configured to reconstruct imaging data acquired by the ~~means for performing~~ magnetic resonance imaging scanner, the ~~reconstructing means~~ reconstruction processor adjusting the reconstructing based on the at least one main magnetic field nonuniformity parameter.

26. (Currently amended) A magnetic resonance imaging apparatus comprising:

a magnetic resonance imaging scanner performing magnetic resonance imaging, the scanner including:

a main magnet generating a main magnetic field,

magnetic field gradient coils, and

at least one radio frequency antenna;

at least one magnetic field sensor measuring spatial data corresponding to the main magnetic field; and

a processor programmed to perform the method of ~~claim 1~~ claim 6 to determine the nonuniformity parameter.

27. (Previously presented) The magnetic resonance imaging apparatus as set forth in claim 26, further comprising:

shim coils for shimming the main magnetic field; and

a reconstruction processor;

the processor being operatively connected with at least one of the shim coils and the reconstruction processor to adjust at least one of shim coil currents and resonance data reconstruction in accordance with the nonuniformity parameter.

28. (New) The magnetic resonance imaging apparatus as set forth in claim 20, wherein the magnetic field sensors comprise:

Hall effect magnetic field sensors.